



INTELLIGENT TRANSPORTATION SYSTEMS - ITS

MDOT Researches Integrated Vehicle Data for Efficiency and Savings

By: Steven J. Cook, P.E. Operations and Maintenance Field Services Engineer

The Michigan Department of Transportation (MDOT) has been actively involved with the United States DOT (USDOT) and the Federal Highway Administration (FHWA) Connected Vehicle program initiatives since 2005. MDOT currently supports several USDOT/FHWA Connected Vehicle projects and has initiated several Connected Vehicle research projects that look at how data from vehicles can enhance and support our current data needs, but also potentially change the way a DOT does business. In partnership with MDOT's Connected Vehicle research program, the USDOT/FHWA Road Weather Management Program (RWMP) proposed funding MDOT's Integrated Mobile Observation (IMO) 2.0 project using MDOT fleet vehicles.

As a result, MDOT has partnered with the University of Michigan Transportation Research Institute (UMTRI) and the USDOT/FHWA RWMP to develop and deploy sensor technology on MDOT fleet vehicles that collect near-real-time vehicle data to support winter weather maintenance decision support systems and other Connected Vehicle initiatives.

For the IMO 2.0 project, MDOT will use 60 MDOT fleet vehicles for the 15-month-long project starting in January 2013. The target vehicles for this project manage the I-94 corridor during the winter months. These vehicles will be instrumented with location based smartphone technology that will provide a Bluetooth connection to a surface >>>

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MDOT WEBSITE

www.michigan.gov/mdot

ITS PROGRAM OFFICE

www.michigan.gov/its

CONNECTED VEHICLES

www.michigan.gov/cv

MI DRIVE WEBSITE

www.michigan.gov/drive

MDOT ITS PLANNING

www.mdotitsplanning.com

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MDOT'S ITS MISSION:

“Develop and sustain a program at MDOT to improve safety, operational performance and integration of the transportation system utilizing Intelligent Transportation System technologies for economic benefit and improved quality of life.”



monitoring device and a small module that plugs into the diagnostic port to collect data from the vehicle Controller Area Network (CAN) bus. Data sets to be collected from the vehicle include; camera image of road conditions, location, time, direction, accelerometer (x,y,z), road surface and air temperature, humidity, dew point, ABS, traction control, wheel speed, and wind shield wiper status.

Not all data sets will be captured on all vehicles. For example, of the 60 vehicles, 20 will be winter maintenance snowplow trucks that will collect smartphone loca-

tion based technology and road surface conditions but not CAN bus data.

Cellular communication via the smartphone will send the data once every five minutes to six potential servers for post processing purposes. The six servers include: IMO 2.0 MDOT/UMTRI, National Center for Atmospheric Research (NCAR), Maintenance Decision Support System (MDSS) – Meridian, NAVTEQ, RITA - Adkins, and MDOT Data Use Analysis and Processing (DUAP) project. The main focus will be directed toward applications developed and used from the data to enhance and support those data sets current-



ly collected by NCAR, MDSS and DUAP.

MDOT is currently piloting the MDSS software (MDOT pool-funded project with 16 other states) in four maintenance garages along the I-94 corridor in the Southwest Region. MDSS collects data from MDOT's Road Weather Information System and CCTV cameras, FAA's Automated Weather Observation System, the National Weather Service, etc. to supplement operators' decisions for roadway management and treatment during a winter weather event. IMO 2.0 will provide near-real time information about current roadway atmospheric conditions, thereby, bridging the data gap that exists between static weather stations feeding MDSS. The goal of MDSS and IMO 2.0 working together is to provide for a more effective and efficient treatment system, so operators can realize true winter maintenance operational savings that add value to the entire organization. □

I-94 Truck Parking Information and Management System Update

By: Collin Castle, P.E. Connected Vehicle Technical Manager

The MDOT ITS Program Office is currently designing a system that will assess truck parking availability along the I-94 corridor in southwest Michigan and deliver real-time parking availability information to truck drivers. The I-94 Truck Parking Information and Management System (TPIMS) project is funded by the FHWA Truck Parking Facilities Discretionary Grants Program.

I-94 in southwest Michigan carries some of the highest commercial volumes in all of the Midwest. Trucks account for approxi-

mately 23 to 30 percent of all traffic in the corridor, making it the highest concentration of commercial vehicles on interstate highways in Michigan. Due to the high volume of commercial traffic, truck parking overcrowding is a major safety concern along the corridor. Rest areas along I-94 in southwest Michigan are overcrowded during peak, nighttime and early morning hours. Trucks routinely park on rest area entrance and exit ramps, the "car side" of rest area parking lots, and on interstate entrance and exit ramps, all while a signifi-

cant portion of the truck parking spaces at private parking facilities are empty and underutilized.

The project approach is to help mitigate truck parking overcrowding and associated safety concerns by monitoring and managing parking availability and providing timely information to commercial vehicle operators in the I-94 corridor for both public and private truck parking facilities. Expanding MDOT rest areas to accommodate the need for more truck parking is not feasible at this time. >>>>

Instead, the project will focus on identifying available parking along with safe alternatives for the overflow parking and communicating that information to commercial vehicle operators.

How is this information being collected and communicated to truck drivers? A number of high tech solutions are being designed to get information to truck drivers, including the use of dynamic truck parking signs, a smartphone application, on board connected vehicle equipment, and notifications on MDOT's Mi Drive traveler information Web site, www.michigan.gov/drive.

With any intelligent transportation system, driver distraction is a major consideration, and will be a critical focus area when designing all aspects of the project. The smartphone and Connected Vehicle applications, in particular, will require additional emphasis with implementation of

capabilities such as Text-to-Speech to reduce driver distraction and improve safety.

Key project goals are enhancing highway safety with timely and reliable truck parking information, providing a sustainable and scalable truck parking solution for future expansion, along with a secure solution that protects user privacy and data, and maximizing user acceptance of the system for making informed truck parking decisions.

The project is currently in design, with field infrastructure to begin construction in the spring/summer of 2013 and a planned completion date in early 2014. For more information about the project contact MDOT Connected Vehicle Technical Manager - Collin Castle, P.E., at CastleC@michigan.gov. □



Upcoming Events

**WED-FRI
09-11**

JAN

National Committee on Uniform Traffic Control Devices

Hilton Crystal City Hotel
2399 Jefferson Davis Highway
Arlington, VA 22202

**SUN-THU
13-17**

JAN

TRB 92nd Annual Meeting

Marriott Wardman Park Hotel
2660 Woodley Road Northwest
Washington, DC 20008

**TUE-WED
26-27**

FEB

ITE 2013 Technical Conference and Exhibit

Sheraton San Diego
1401 West Green St
Urbana, IL 61801

**TUE-THU
16-18**

APR

SAE World Congress and Exhibition

Cobo Center
1 Washington Boulevard #401
Detroit, MI 48226

**MON-WED
22-24**

APR

23rd ITS America Annual Meeting

Gaylord Opryland Resort and Convention Center
2800 Opryland Dr.
Nashville, TN 37214

*If you have an event or an article that you would like included in future editions of *The Intelligent Traveler*, please contact the editorial staff.

Training Opportunities

- Introduction to ITS Architecture

Provided by Iteris:

www.iteris.com/itsarch/html/training/useandmainttraining.htm



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